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THE EFFECT OF BLENDED LEARNING ON THE INNOVATION AND INFORMATION TECHNOLOGY IN EDUCATION

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ABSTRACT

The objectives of the study were (1) to develop an online learning on innovation and information technology in Education, (2) to compare learners' learning achievement in both and experimental group and a control group, and, (3) to evaluate the students' satisfaction towards who studied through the blended learning. The research samples were purposively selected from 30 undergraduate students at the Faculty of Industrial Education, Rajamangala University of Technology Suvarnabhumi, who enrolled in this course in first semester of academic year 2017. The samples divided into two groups by simple random sampling: the control group of 15 students studied with the conventional teaching method while the experimental group of 15 students studied with the blended learning. The data were analyzed by using mean, standard deviation, and t-test.

The result revealed that (1) the efficiency of the online learning on innovation and information technology in Education, was 83.30/80.20, which met the prescribed criterion 80/80 level. (2) The learning achievement of students who studied with the blended learning method was higher than the students studied with the tradition method at the statistically significant level of .05. (3) The students' satisfaction toward learning with the blended learning method was at a highest level.

Keywords: Blended Learning, Online learning, innovation and information technology in Education, Industrial Education

1. INTRODUCTION

The concept of blended learning has been around for a long time, but its terminology was not firmly established until around the beginning of the 21st century. Graham (2006) defined "blended learning systems' as learning systems that "combine face-to-face instruction with computer mediated instruction." Poon (2013: 1) adds that the aim of the two delivery methods is to complement each other. Currently, the use of the term blended learning involves combining Internet and digital media with established classroom forms that require the physical co-presence of teacher and students, (Friesen: 2012). The article underscores the concept that many "ingredients" can comprise a blended learning model, including instructor-delivered content, e-learning, webinars,

conference calls, live or online sessions with instructors, and other media and events, for example, Facebook, e-mail, chat rooms, blogs, podcasting, Twitter, YouTube, Skype and web boards.

Such definitions include Singh (2003) who considered blended learning as a combination of multiple delivery media designed to complement face to face and online delivery while promoting "learning and application learned behaviour" (p51). Thorne (2003) explained it as "a way of meeting challenges of tailoring learning and development to the needs of individuals by integrating innovative and technological advances". Dziuban, Hartman & Moskal (2004) recommended that it "should be viewed as a pedagogical approach that combines the effectiveness and socialization opportunities of the classroom with technologically enhanced active learning opportunities" . Typically, blended learning makes extensive use of learning technologies through the "blend" of physical and virtual environments in order to supplement traditional Face to Face learning. As yet there does not seem to be a perfect balance or manner of implementation and there seem to be a number of models that have developed to suit particular circumstances (International Association for K-12 Online Learning, 2008) Blended learning has increased opportunities for the learner, with learning occurring across different mediums and at various times (White & Geer 2010) giving increased flexibility to the learners. Brown (2003) suggests that the blended environment provides all the benefits of e-learning such as time efficiency and location convenience and the face to face advantages of one to one personal understanding and motivation. There is also the possibility of increased personalization with learners having greater choice in what and for how long they access the activity. Face to face classes offer assistance in the development of social presence or 'social comfort' which is more difficult and often takes longer in a totally online environment. This leads to learners feeling more comfortable interacting with their peers online and sharing ideas and resources while further building on their own understanding. Blended learning also benefits educators (Drysdale, Graham, Spring, & Halverson, 2013), as it provides them with opportunities to have mainly face to face classes but also begin to expand their expertise in the online environment, although their needs are sometimes neglected.

2. OBJECTIVES OF THE RESEARCH

The objectives of the study were (1) to develop an online learning on innovation and information technology in Education, (2) to compare learners' learning achievement in both and experimental group and a control group, and, (3) to evaluate the students' satisfaction towards who studied through the blended learning.

3. METHODOLOGY

This study is of a quasi-experimental design with two-group comparison. The experimental group underwent the students who studied through blended learning whereas the control group received conventional instruction. The sample was 30 students who registered on topic in the first semester

in the academic year 2017 Faculty of Industrial Education at Rajamangala University of Technology Suvarnabhumi.

3.1 Population and Participants

The populations were 30 learners who were registered microteaching in the first semester in the academic year 2017 Department of Industrial Education at Rajamangala University of Technology Suvarnabhum

3.2 Instrumments

3.2.1 Online learning on "innovation and information technology in Education"

3.2.2 The achievement test: the pre-test and post-test consisted of a multiple choice. The tests were constructed to assess students' learning achievement for both groups. Through students' learning achievement score on the topic that can see whether students improve their learning

3.3.3 A questionnaire; to find out students' attitude about blended learning consisted of 10 questions under a Likert scale ranging from 1 to 5, was used to collect the data.

3.3 Data Collection

The data obtained from different methods was analyzed and interpreted in quantitative data analysis. The data obtained from the pre-test and post-test and attitude questionnaire. The statistical analysis of data included mean, Standard Deviation (SD), *t*-test independent.

4 RESULTS AND DISCUSSION

1. The results of develop an online learning on innovation and information technology in Education

Table 1: The result of three trials

Trial	Efficiency of process (E_1)	Efficiency of results (E_2)
Individual	75.55	72.00
Small Group	79.25	78.50
Field	83.30	80.20

The online learning on innovation and information technology in Education had efficiency at the level 83.30/80.20 which met the specified criteria 80/80. This was because the e-learning was completely developed in three; an individual, a small group, and a field trial. For each step, the researcher could see both good and bad points. Thus, every step of trying out helped to develop the online learning. It might be that students were interested in doing exercises on the lesson and checked their answers with immediate feedback. Besides, the post-test had more difficulty than exercises; therefore, the efficiency of the outcomes was lower than the efficiency of the process.

2. The results of comparing learning achievement for both groups

Table 2: Post-test of the learners' achievement of experimental group and a control group

Trial	N	Mean	Std.Dviation	*t*	Sig
Experimental	15	17.30	1.74	7.22*	0.00
Control	15	13.20	3.14		

df= 28 , *p* <0.05

Comparing learning achievement for both groups showed that the experimental group had a higher average post-test score than the control group with a statistically significant difference **Table 3** Students' satisfaction towards blended learning

at the 0.05. The might be due to the fact that learners had more of a chance to learn collaboratively and help and support their friends. However, when comparing the learning achievement of learners in the experiment, it was found that the average post-test score was not very high. One explanation for this was that each learner had different learning ability. Since there were detailed unit and lots of practices and exercises on the online learning learners may have needed more time understanding and training.

Items	$\overline{X}$	S.D	Level
Content	4.52	0.56	highest
Interactive	4.40	0.56	highest
Climate of teaching and learning	4.23	0.71	highest
Total Average	4.38	0.61	highest

Table 3 demonstrated that the students' satisfaction toward learning with the blended learning method was at a highest level ($\overline{X}$ =4.38). Considering for each item, it was revealed that Climate of teaching and learning ($\overline{X}$ = 4.23), Interactive ($\overline{X}$ = 4.40), and content ($\overline{X}$ = 4.52).

5 CONCLUSIONS

5.1 The online learning on innovation and information technology in Education had efficiency at the level 83.30/80.20 which met the specified criteria 80/80

5.2 Comparing learning achievement for both groups showed that the experimental group had a higher average post-test score than the control group with a statistically significant difference at the 0.05.

5.3 The students' satisfaction toward learning using the blended learning was at a highest level.

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